

AMENDMENT TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS

2. (previously presented) A method for segmenting stereoscopic information into 3-D objects comprising the steps of:
 - acquiring a set of multiple images of a scene substantially simultaneously and having a predetermined geometric relationship with each other;
 - filtering each of said acquired multiple images to obtain multiple sets of features observed in each of said corresponding multiple images;
 - processing at least two pairs of sets of features to generate at least two result sets according to matching features between members of each pair of sets of features;
 - selecting features from said at least two result sets according to a predetermined orientation threshold;
 - extracting 3-D features from said selected features;
 - filtering said 3-D features according to location; and
 - clustering any remaining 3-D features into discrete 3-D objects.
3. (previously presented) The method of claim 2 in which said step of filtering each of said acquired multiple images further includes the steps of:
 - digitizing each image into a two-dimension grid of pixels, each pixel having a light intensity value;
 - evaluating said grid to identify areas in which said light intensity values of adjacent pixels indicate presence of an edge of an object;
 - processing each of said edges using parabolic smoothing, followed by a non- integral sub-sampling, Sobel edge detection, true peak detection and chaining of edgelets into edges;
 - characterizing each edge according to its xy location, its magnitude, and its orientation angle; and

discarding any edge that has a magnitude less than a predetermined threshold.

4. (previously presented) The method of claim 2 in which said step of processing further includes the steps of:

matching features from a right image and a left image to form a set of horizontal disparities; and

matching features from a right image and a top image to form a set of vertical disparities,

wherein said right and left images were obtained from image acquisition devices arranged along a horizontal line, and said right and top images were obtained from image acquisition devices arranged along a vertical line substantially perpendicular to said horizontal line.

5. (previously presented) The method of claim 4 in which each said step of matching further comprises the steps of:

for each feature in a first image, removing features in a second image that do not satisfy an epipolar constraint, calculating a strength of match (SOM) for each remaining feature in said second image, eliminating features from said second image whose SOM is less than a predetermined threshold, calculating a new SOM according to the SOM of neighboring features on a chain of each remaining feature in said second image, and designating the features having the strongest SOM as a match.

6. (previously presented) The method of claim 5 in which each said step of designating features as a match is repeated for a fixed number of iterations.

7. (previously presented) The method of claim 2 in which the step of selecting further comprises the steps of:

calculating a disparity vector for each feature of each of said result sets;

selecting features of a horizontal result set if said disparity vector is within a predetermined range of vertical orientation angles;

selecting features of a vertical result set if said disparity vector is outside of said predetermined range of vertical orientation angles; and
discarding features of each result set that were not selected.

8. (previously presented) The method of claim 7 in which said predetermined range of vertical orientation angles is approximately 45 degrees to 135 degrees and approximately 225 degrees to 315 degrees.
9. (previously presented) The method of claim 2 in which said step of extracting is implemented by calculating a set of 3-D points corresponding to said selected features.
10. (previously presented) The method of claim 2 in which said step of filtering said 3D features further comprises the steps of:

converting all 3-D points of said selected features into a coordinate system related to a plane; and

eliminating points that exceed application-specific thresholds for relative range, lateral offset, and distance from said plane;

whereby points that do not correspond to objects of interest are eliminated from further segmentation.
11. (previously presented) The method of claim 2 in which said step of clustering further comprises the steps of:

organizing chains of features according to changes in a range dimension between successive points on a chain;

merging said chains according to their overlap; and

identifying separated objects as a function of distance exceeding a predetermined threshold.

Claims 12 – 15 cancelled.